

**Improvements in or relating to pneumatic tyres**

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Applicant(s): DUNLOP RUBBER CO  
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IPC Classification:  
EC Classification: B60C9/20B, B60C19/00H  
Equivalents: ☐ DE1007644, ☐

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**Abstract**

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## Description

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### PATENT SPECIFICATION

Inventor: HENRY RAYMOND FLETCHER 753,533 Date of filing Complete Specification: Nov. 30, 1954.

Application Date: Dec. 3, 1953.

No. 33575/53.

Complete Specification Published: July 25, 1956.

Index at acceptance:-Class 144(2), C3B(7: 9).

### COMPLETE SPECIFICATION

PATENTS ACT, 1949 SPECIFICATION NO. 753. 533

In pursuance of Section 8 of the Patents Act, 1949, the Specification has been amended In the following manner:Page 2, delete line 7, insert wln British Patent Specification No. 753,963 there is described and claimed a pneumatic tyre which incorporates between the reinforcing plies (breaker strips) and the carcass plies a shock-absorbing layer of rubber having a low tangential modulus of elasticity. It is stated therein that a rubber layer of a ccapound having the character of sponge rubber is, generally speaking, the most suitable.

According to the present invention the rubber cushion sandwiched between the breaker and the carcass is preferably of rubber or similar composition to that normally used for the construction of tyre carcasses and in any case is not rubber of a low tangential modulus of elasticity. We do not claim pneumatic tyres having rubber of a low tangential modulus of elasticity as claimed in British Patent Specification No. 753,963.

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## Claims

Subject to the foregoing disclaimer Mshat we claim is:-

THE PATENT OFFICE, 25th July, 1957 reauces Lelc wCIUw11.Y WLU 1V the carcass and the breakers which exists when they are directly connected. To obtain this result the minimum thickness of the cushion should be 2mm. in the case of aircraft covers and 4mm. in the case of giant covers.

For any given type of cover there is a maximum radial thickness which should not be exceeded, but subject to the provision of a tread of adequate thickness, it is desirable that the thickness of the cushion should be greater than the minimum given above.

Moreover, as in the usual tyre construction the distance between the outer surfaces of the tread and carcass is greater at the shoulders than at the crown, it is possible zn\_:

ME 6387/1(8)/37Z7 100 7/57 R adjacent plies cross. 75 A rubber cushion 14 is sandwiched between the breaker 12, 13 and the carcass 10 and consists of a strip of rubber of similar composition to that normally used for the construction of tyre carcasses. The cushion 80 14 has a thickness at each side, i.e. at 14a, of 5mm. tapering therefrom to a minimum thickness at the peak of the crown 14b, of 3mm. The depth of the tread rubber measured from its outer periphery to the upper 85 surface of the outer steel breaker ply 12 is substantially constant across the whole of the crown of the cover and measures about 9mm. The tread pattern comprises a plurality of recesses 15 equally spaced 90 X1i...

C\_ PATENT SPECIFICATION Inventor: HENRY RAYMOND FLETCHER 753,533 Date of filing Complete Specification: Nov. 30, 1954.

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Index at acceptance:-Class 144(2), C3B(7: 9).

COMPLETE SPECIFICATION Improvements in or relating to Pneumatic Tyres We, DUNLOP RUBBER COMPANY LIMITED, a British Company, of 1, Albany Street, London, N.W.1., do hereby declare the invention, for which we pray that a s patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement: This invention relates to pneumatic tyre covers.

It is an object of the present invention to provide a pneumatic tyre cover particularly for use on aircraft wherein the carcass is protected against damage by cutting from sharp flints or the like or by puncture.

According to the invention a pneumatic tyre cover comprises a carcass, a tread portion, a breaker between the tread portion and the carcass and extending around the entire circumference of the cover, said breaker comprising a ply or plies of steel cords, the cords in the ply or each of the plies being mutually parallel, and a rubber cushion of substantial thickness sandwiched between the breaker and the carcass.

The rubber cushion allows relative movement between the steel breaker and the carcass during flexing of the cover and so reduces the tendency for the separation of the carcass and the breakers which exists when they are directly connected. To obtain this result the minimum thickness of the cushion should be 2mm. in the case of aircraft covers and 4mm. in the case of giant covers.

For any given type of cover there is a maximum radial thickness which should not be exceeded, but subject to the provision of a tread of adequate thickness, it is desirable that the thickness of the cushion should be greater than the minimum given above.

Moreover, as in the usual tyre construction the distance between the outer surfaces of the tread and carcass is greater at the shoulders than at the crown, it is possible IDS2 and desirable, by maintaining the tread thickness constant, to make the cushion thickness greater at the shoulders than at the crown.

One embodiment of the invention will now be described by way of example and with reference to the accompanying drawings wherein:

Figure 1 is a view in cross-section of part of a pneumatic tyre cover in accordance with the invention, and Figure 2 is a plan view taken in the direction of the arrow "A" of the steel breaker (with the tread portion of the cover removed). A flexible lightweight aircraft tyre carcass is constructed in the conventional manner from 8 plies of nylon cords having a bias angle of 45°. The carcass is surmounted by a rubber tread portion which encloses a breaker of steel cords extending around the entire circumference of the tyre.

The breaker comprises two plies of steel cords, the cords in each ply being mutually parallel and disposed at 45° bias angle, the series of cords in each ply respectively being inclined in opposite directions relative to the longitudinal median plane of the cover whereby the cords in the adjacent plies cross. A rubber cushion is sandwiched between the breaker and the carcass and consists of a strip of rubber of similar composition to that normally used for the construction of tyre carcasses. The cushion has a thickness at each side, i.e. at the sides, of 5mm, tapering therefrom to a minimum thickness at the peak of the crown of 3mm. The depth of the tread rubber measured from its outer periphery to the upper surface of the outer steel breaker ply is substantially constant across the whole of the crown of the cover and measures about 9mm. The tread pattern comprises a plurality of recesses equally spaced around and across the ground-contacting surface of the tread, and the depth of the recesses is such that only a small clearance of about 0.5mm. exists between the base of the recesses and the cords of the top breaker ply.

WHAT WE CLAIM IS: 1. A pneumatic tyre cover comprising a carcass, a tread portion, a breaker between the tread portion and the carcass and extending around the entire circumference of the cover, said breaker comprising a ply or plies of steel cords, the cords in the ply or each of the plies being mutually parallel and a rubber cushion of substantial thickness sandwiched between the breaker and the carcass.

2. A pneumatic tyre cover in accordance with claim 1 having more than one ply of steel cords and wherein the cords in adjacent plies are inclined in opposite directions relative to the longitudinal median plane of the cover.

3. A pneumatic tyre cover in accordance with either of the preceding claims wherein the rubber cushion has a minimum thickness of 2mm:

4. A pneumatic tyre cover in accordance with any of the preceding claims wherein the overall thickness of the tread is substantially constant and the cushion thickness is greater at each side thereof than at the peak of the crown of the cover.

5. A pneumatic tyre cover constructed and arranged substantially as described herein with reference to the accompanying drawings.

G. W. I. SHEAVYN, Agent for the Applicants.

PROVISIONAL SPECIFICATION Improvements in or relating to Pneumatic Tyres We, DUNLOP RUBBER COMPANY LIMITED, a British Company, of 1, Albany Street, London, N.W.1., do hereby declare this invention to be described in the following statement: This invention relates to pneumatic tyre covers.

It is an object of the present invention to provide a pneumatic tyre cover particularly for use on aircraft wherein the carcass is protected against damage by cutting from sharp flints or the like or by puncture.

According to the invention a pneumatic tyre cover comprises a carcass, a tread portion, a breaker between the tread portion and the carcass and extending around the entire circumference of the cover, said breaker comprising a ply or plies of steel cords, the cords in the ply or each of the plies being mutually parallel, and a rubber cushion of substantial thickness sandwiched between the breaker and the carcass.

The rubber cushion allows relative movement between the steel breaker and the carcass during flexing of the cover and so reduces the tendency for the separation of the carcass and the breakers which exists when they are directly connected. To obtain this result the minimum thickness of the cushion should be 2mm. in the case of aircraft covers and 4mm. in the case of giant covers.

For any given type of cover there is a maximum radial thickness which should not be exceeded, but subject to the provision of a tread of adequate thickness, it is desirable that the thickness of the cushion should be greater than the minimum given above.

Moreover, as in the usual tyre construction the distance between the outer surfaces of the tread and carcass is greater at the shoulders than at the crown, it is possible and desirable, by maintaining the tread thickness 80 constant, to make the cushion thickness greater at the shoulders than at the crown.

One embodiment of the invention will now be described.

A flexible lightweight aircraft tyre carcass 85 is constructed in the conventional manner from 8 plies of nylon cords having a bias angle of 45°. The carcass is surmounted by a rubber tread portion which encloses a breaker of steel cords extending around the 90 entire circumference of the tyre. The breaker comprises two plies of steel cords, the cords in each ply being mutually parallel and disposed at a 45° bias angle, the steel cords in the adjacent plies being indined in opposite directions relative to the longitudinal median plane of the cover whereby the cords in the adjacent plies cross.

A rubber cushion is sandwiched between 100 the breaker and the carcass and consists of a strip of rubber of similar composition to that normally used for the construction of tyre carcasses. The cushion has a thickness at each side, i.e. adjacent to the tread buttresses, of 5mm. tapering therefrom to a minimum thickness at the peak of the crown, of 3mm. The depth of the tread rubber measured from its outer periphery to the upper surface of the outer steel 110 breaker ply is substantially constant across the whole of the crown of the cover and measures about 9mm. The tread pattern 753,533 comprises a plurality of recesses equally spaced around and across the groundcontacting surface of the tread, and the depth of the recesses is such that only a small clearance of about 0.5mm. exists between the base of the recesses and the cords of the top breaker ply.

G. W. I. SHEAVYN.

Agent for the Applicants.

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753,533 COMPLETE SPECIFICATION

1 SHEET

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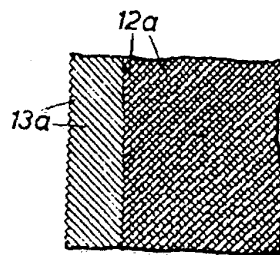
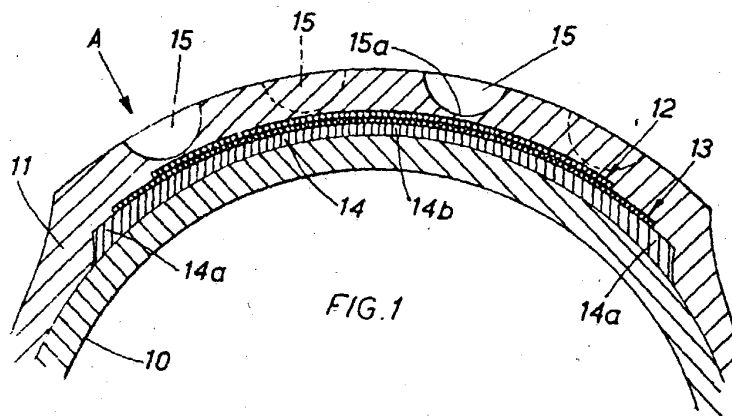


FIG. 2